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Stated Meetings of The American Entomological Society will be held at 8.00 P. M., in 1942, on the fourth Thursday of each month excepting June, July, August, November and December, and on the third Thursday of November and December. Communications are solicited.

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ENTOMOLOGICAL NEWS

VOL. LIII JUNE, 1942 No 6

Clouds of Butterflies in Mexico: A Study in Butterfly Aggregations (Lepid.: Rhopalocera).

By PHIL RAU, Kirkwood, Missouri.

(Continued from page 126.)

VICTORINA STELENES BIPLAGIATA Frühst.

This large black butterfly is beautifully decorated in green, and according to Holland is quite common throughout tropical America. It is an individualist, and does not often congregate, but many individuals are often seen at rest singly in culverts and under bridges. However, one group of 11 was seen at high noon near the Canyon de Galeana, resting on the moist ground near groups of other species. These were all very close together, with wings erect, and during the hour that I watched them they never moved except when at long intervals one or another of them would partly open and slowly close the wings. There was no regularity about the motion, and rarely did two of them move at the same time. This particular spot was rich in groups of butterflies of various species but there was no intermingling. Again all of the samples taken for identification were males.

COLAENIS JULIA Fabr.

This is a brick-red butterfly, delicately marked in black. Many of them rested, singly or in twos and threes, on the shaded walls, floors, and entrances of large culverts under the highway. Although many groups of other kinds of butterflies were nearby, these remained by themselves. Further down the highway, three other small groups of 4 to 6 each were seen under exactly the same conditions. They rested 1 to 3 inches apart, and only occasionally one or another would gently open and close its wings.

ACHLYODES THRASO Hbn.

This dark brown butterfly has a purple tinge on the wings. The dull colors of pinned specimens in a cabinet give a very false idea of the rich coloring of the living wings in the dazzling tropical light.

These were seen in aggregations only a few times. They were found as neighboring groups of *Coleanis julia*. The clusters comprised from 12 to 20 individuals, resting precisely at wings-length from one another, and this because the wings were always spread three-fourths open. A dozen butterflies in this position made a striking shimmering mosaic, indeed.

The behavior of a new member entering the group was entertaining to see. The newcomer would drop to the ground on the outskirts of the circle and slowly make its way into the group, walking in a hobbling manner, and occasionally flipping the wings to measure its distance from the others. Not until its wings touched others, did it stop, open its wings and languidly relax. When a flock was disturbed into flight, they all soon returned, each one following the routine just described, until all rested again in a precisely spaced group.

ANAEA AIDEA Guer.

Several thousand of these reddish-brown butterflies were resting on two stone walls of a bridge near Valles; they were not in groups, and showed no tendency to gregariousness. They were merely at rest in the same shelter where they took positions on the walls without any systematic order. All of the samples collected were males.

THREE SPECIES OF EUREMA BUTTERFLIES

All along the highway many aggregations of small, yellow butterflies of one or more species were seen. So many groups were observed and their behavior was so much the same that it is only necessary to give the details of one such group.

This cluster, near Rio Tampaon, contained approximately 150 yellow butterflies of three species, all of which look much alike to the layman. They were: *Eurema gratiosa ingrata* Felder, *E. mexicana* Bdv. and *E. neda nelphe* Felder. Also several solid clusters of *Eurema neda nelphe* Felder of 10 to 25

butterflies each were seen in moist places between Rio Purificacion and Villa Juarez. Although the aggregations were near other groups, the yellows kept to themselves. About two dozen specimens of these three species were taken, and all were males.

On rare occasions a large cluster of these small yellows would contain a few of the large yellow ones, *Phoebis agarithe maxima,* and in one instance a group of 50 yellow *Eurema* sp. had among them 12 blue skippers of unknown name.

MOTTLED BLACK, BROWN, RED AND SALT-AND-PEPPER BUTTERFLIES.

An aggregation of about 75 butterflies which appeared to be of three species but proved to be of five, was observed at a moist place near the highway ten miles north of Victoria. Color was no barrier in this group, since among them were black and red mottled ones; black ones with white spots on the upper wings and red on the lower wings; black, white and red mottled ones, and black and red banded ones. The various colors harmonized well together since all were of somber hue and all were of about the same size.

The five species identified among this aggregation were: *Phyciodes vesta* Edw., form *boucardi* Godm. and Salv.; *Anthanassa texana* Edw.; *Chlosyne* sp. near *lacinia* Gey.; *C. lacinia adjutrix* Scud.; and *C. janais* Drury. It is interesting to note that all five species belong to the family Nymphalidae.

Several thousand *Chlosyne lacinia adjutrix* Scud. were seen also on the walls and ceiling of a culvert under the highway during the hottest and dryest part of the day near Edinburg, Texas, in the Rio Grande Valley. These were gregariously close together in ten groups, and when disturbed would soon resettle in the same place. Out of 16 specimens brought home, only two were females. Among the five species all were males except for a few females of *A. texana.*

CHIOMARA ASYCHIS Cram.

Among many clusters of various species in a moist area under a bridge 15 miles south of Rio Purificacion was one

lone group of this gray and white butterfly, *Chiomara asychis* Cram. There were 20 in this lot, all quietly at rest, 2 to 3 inches apart, but they kept as a unit and did not mingle with the others all around them. Half of the lot was taken, and all were males.

PRECIS LAVINIA ZONALIS Felder.

Under the same bridge were two aggregations of about a dozen butterflies each of *Precis lavinia zonalis* Felder., the brown butterfly that is dappled in red and has eye-spots on the wings. Both sexes were present.

ATHENA CHIRON Fabr.

Again under the same bridge were clusters of this butterfly, a dark brown insect with delicate bands of a lighter brown on the wings. The two groups of 10 and 15 individuals each were in moist places and kept aloof from other aggregations. The random sample proved to be males.

ATHENA PETREUS Cram.

These bright red butterflies with slight, black margins on all four wings were found in several localities from Villa Juarez to Valles, congregating in moist places in groups of 6 to 12. They rested quietly, about an inch apart. The specimens taken were all males.

CHIOIDES ZILPA Butl.

This is a black butterfly with a few white blotches on the upper wings; the hind wings taper to form a short tail, which in living specimens is somewhat twisted. This species was often seen between Valles and Tamazunchale, on cool, wet ground or on walls of culverts. They were non-social and each individual kept strictly to himself. The few specimens taken were males.

CHLOSYME JANAIS Drury and MICROTIA ELVA Bates.

Here are two species of butterflies often intermingling, and belonging to different genera of the family, Nymphalidae. Both are similarly colored in black and orange. The former species is large, has black front wings with occasional white blotches, and orange hind wings bordered in black; the latter

species is smaller and is marked in black and orange on all four wings.

About twenty solid aggregations of one or the other of these species and about ten in which both species were together, were seen along the road from Valles to Tamazunchale. They were in groups of from 6 to 15 individuals. All that were taken were males.

PHOEBIS SENNAE EUBULE Linn. and ASCIA MONUSTE MONUSTE Linn.

These observations were made at a considerable distance from the preceding ones, and at a higher altitude, 15 miles north of Jalapa, Vera Cruz. These two species were of different colors, the first orange-and-yellow, the second white. Three aggregations were seen on July 18, at a damp place under a bridge. The first and second groups, comprising 110 and 100 individuals respectively, were all the orange and yellow *P. sennae eubule;* the third lot contained 75 of these and 5 of the white *A. monuste monuste.* Since both species belong to the family Pieridae, we need not be wholly surprised at the combination, even though their colors are different. All the samples were males.

It is interesting to note in passing that many of the white butterflies *A. monuste* were seen on pellets of donkey dung at Tamazunchale, and apparently feeding upon it.

(To be continued.)

Changes at the Ohio State University.

Dr. Laurence H. Snyder, professor of zoology, will become chairman of the department of zoology and entomology on July 1, succeeding Dr. Raymond C. Osburn, who is retiring with the title emeritus. He has been chairman since 1917. During eighteen years of this period, 1918 to 1936, Dr. Osburn was director of the Franz Theodore Stone Laboratory on Gibraltar Island in Lake Erie.—*Science,* April 24, 1942.

Memorial Tablet to Dr. Levi W. Mengel.

The Board of School Directors and the Management of the Museum announced the unveiling of a memorial tablet to Dr. Mengel at the Reading Public Museum and Art Gallery on Saturday afternoon, May 9th, 1942.

Stittocapsus new genus and Calocoris texanus new species from the United States (Hemiptera, Miridae).

By HARRY H. KNIGHT, Iowa State College, Ames, Iowa.

STITTOCAPSUS, new genus.

Allied to *Adelphocoris* Reuter but with females brachypterous; lateral margins of pronotum rounded gradually to the propleura, anterior angles very narrow, not prominent, the lateral margins of calli almost meeting with top of coxal cleft. Arolia erect, parallel, divergent on apical half, less widely separated than in *Adelphocoris*, but typical of the Capsinae. Hind femora slender, not tapered as in *Phytocoris*. Head inclined, tylus prominent, strongly convex except on apex; rostrum reaching to apex of middle coxae. Antennae slender, first segment short, not equal to width of head, clothed with short recumbent pubescence. Dorsum and body beneath sparsely clothed with short, recumbent pubescence; impunctate, moderately shining. Male macropterous, the female brachypterous. Genital claspers rather similar in type to Adelphocoris but left clasper with a small, right angled hook on apex.

Genotype: *Stittocapsus franseriae* n. sp.

Stittocapsus franseriae new species.

♂. Length 7.5 mm., width 2.5 mm. Head: width 1.14 mm., vertex .43 mm., ecarinate, smooth and shining, vertex and frons convex, tylus strongly convex except on apical one-third; eyes vertical in position, moderately sinuate about base of antenna, reddish brown. Rostrum, length 2.03 mm., reaching to near apex of middle coxae, pallid, apex blackish. Antennae: segment I, length .82 mm., thickness .13 mm., cylindrical, clothed with short, recumbent black pubescence, pallid, base and ventral aspect with fuscous spots; II, 2.51 mm., slender, slightly more slender at base, pale to yellowish, clothed with fine, short pale and dark pubescence intermixed; III, 1.73 mm., dusky yellow; IV, .90 mm., dusky.

Pronotum: length 1.21 mm., width at base 2.2 mm.; lateral margins not distinct, but rounded over to the propleura, anterior angles narrowed, indistinct, calli impressed on margins, lateral margins extending almost to coxal cleft which is visible from above; collar distinct, stricture joined by coxal cleft behind middle of eye. Pronotal disk evenly convex, moderately shining, obsoletely transversely rugulose, impunctate or with micropunctures only at origin of the fine, pale pubescent

hairs; margins of calli infuscated.

Scutellum moderately convex, transversely rugulose, but not distinctly punctate; pallid to yellowish, fuscous on basal impression. Mesoscutum prominent, sloping down to base of scutellum, pale to fuscous and brown.

Hemelytra elongate, embolar margins nearly straight, cuneus elongate (length 1.51 mm., width at base .60 mm.); membrane fully developed, fuscous, veins pallid, a calloused line bordering the brachium; color pallid to white, basal half of clavus except the prominent claval vein, narrow base and apical area of corium and embolium, and apical half of cuneus fuscous to dark brown; clothed with fine, recumbent, pale to dusky pubescence. Thorax and venter pallid to yellowish green, sternum fuscous.

Legs pallid, femora with rows of fuscous dots, two rows on anterior face but more irregularly placed on apical half of posterior aspect; tibial spines black but without spots at base; tips of tarsi and the claws blackish. Genital segment of a form related to *Adelphocoris,* but left clasper with a small yet distinct right angled hook on apex.

♀. Brachypterous, length 5.6 mm., width across abdomen 2.9 mm.; membrane absent, cuneus reduced to a small incurved flap, leaving three or four abdomenal segments exposed. Head: width 1.17 mm., vertex .56 mm.; frons more strongly convex than in the male, smooth, shining, very finely pubescent. Rostrum, length 2.12 mm., attaining apices of middle coxae. Antennae: segment I, length .74 mm., cylindrical; II, 2.29 mm., slender; III, 1.6 mm.; IV, .73 mm.

Pronotum: length .90 mm., width at base 1.8 mm.; central area of disk suddenly and strongly convex beginning just behind the calli. Scutellum strongly convex, smooth, obsoletely rugulose, yellowish; mesoscutum nearly flat and on a level with base of scutellum. General coloration pallid to greenish yellow, fuscous areas of the hemelytra rather similar to those of the male; legs pallid to yellowish, fuscous dots nearly obsolete.

Holotype: ♂ April 1, 1941, Mohawk, ARIZONA (Loyd L. Stitt); author's collection. *Allotype:* same data as the type. *Paratypes:* 5 ♂ 7 ♀, taken with the types on *Franseria dumosa* (Loyd L. Stitt). 6 ♂ 6 ♀ April 6, 1937, Mohawk, ARIZONA (Loyd L. Stitt), on *Franseria dumosa.* ♂ ♀ April 16, 1937, Quartzsite, ARIZONA (Loyd L. Stitt). CALIFORNIA—♀, San Gorgonio Pass (P. H. Timberlake); this specimen recognized by Mr. Stitt in a collection box carried by Dr. R. L. Usinger.

UTAH—♂, St. George (A. M. Woodbury); received from Dr. Elden Beck about seven years ago.

The genus *Stittocapsus* is named in honor of Mr. Loyd L. Stitt who is doing some good ecological work on Miridae in Arizona. When the first specimen was received from Dr. Beck the writer recognized this Mirid as something new but set it aside to await the appearance of more material.

Calocoris texanus new species.

Distinguished by the orange coloration, with antennae, tibiae, and tips of femora black. The slender third and fourth antennal segments place this species in *Calocoris* rather than *Adelphocoris*.

♀. Length 6.9 mm., width 2.85 mm. Head: width 1.17 mm., vertex .476 mm.; frons smooth, convex, without trace of transverse striae; orange colored, tip of tylus slightly infuscated. Rostrum, length 3 mm., just attaining apex of hind coxae, orange colored, apex black. Antennae: segment I, length 1.01 mm., thickness .146 mm.; II, 3.14 mm., thickness .086 mm.; III, 2.81 mm., thickness .061 mm.; IV, 1.55 mm., thickness .043 mm.; black, clothed with fine pale pubescence.

Pronotum: length 1.34 mm., width at base 2.20 mm.; disk rather evenly, moderately convex, impunctate, but finely transversely rugulose; calli smooth, moderately shining, posterior margins delimited by a smooth impression; color uniformly orange, without spots. Scutellum rugulose, mesoscutum moderately exposed. Hemelytra with embolar margins slightly arcuate, cuneus normally dark fuscous. Dorsum and body beneath clothed with recumbent, fine yellowish pubescence. Legs orange colored, tibiae, tarsi, and tips of femora black. Venter uniformly orange colored.

Holotype: ♀ June 18, 1936, Uvalde, TEXAS (S. E. Jones); author's collection.

Calocoris palmeri Uhler (1872) was described from Arizona. The writer has recently recognized this as identical with *Calocoris fasciativentris* Stal (1862). Specimens at hand were taken Sept. 4, Sept. 26, 1925, Santa Rita Mts., Arizona (A. A. Nichol).

The Butterflies of Roanoke and Montgomery Counties, Virginia (Lepid.: Rhopalocera).

By Carroll E. Wood, Jr. and Carl W. Gottschalk.

(Continued from page 146.)

In both counties as everywhere else occur a number of butterflies which seem to show a total disregard for faunal zones, and in this state, at least, proceed to distribute themselves from the Lower Austral to the Canadian. Many of our commonest species take this unethical attitude. Typical of these ubiquitous insects are:

Megisto cymela
Polygonia interrogationis
Polygonia comma
Nymphalis antiopa creta
Vanessa atalanta
Vanessa virginiensis
*Vanessa cardui
*Precis coenia
Basilarchia arthemis astyanax
Basilarchia archippus
Phyciodes tharos
Euptoieta claudia
*Danaus plexippus
Feniseca tarquinius
Lycaena hypophlaeas
Everes comyntas
Lycaenopsis pseudargiolus
Strymon melinus
Pieris rapae
Anthocharis genutia
*Phoebis eubule
Colias philodice
Colias p. eurytheme
*Terias lisa
Papilio philenor
Papilio asterias
Papilio glaucus
Papilio troilus
Papilio marcellus
Proteides clarus
Achalarus lyciades
Thorybes bathyllus
Thorybes pylades
Pyrgus communis
Pholisora catullus
Erynnis martialis
Erynnis juvenalis
Erynnis horatius
Ancyloxypha numitor
Polites themistocles
Polites manataaqua
Polites peckius
Poanes zabulon
Atrytone ruricola

In addition to the summer visitors already mentioned, those species here marked by an asterisk (*) are known to be or are suspected of being visitors who take up more or less permanent residency in our area. *Vanessa cardui* is of irregular occurrence, sometimes common, but in some years absent.

Localities.

In Montgomery County the area around Blackburg has been most intensively worked, while in Roanoke County the Salem

area is best known. Consequently, many of the records are from these two sections. However, collections have also been made in many other parts of both counties.

The localities represented by capital letters in the list of butterflies are as follows:

AB: Ash Bottom, Roanoke County, 1.6 mi. NW of Salem P. O., referring particularly to a clover field and an adjoining brushy hillside.
B: Blacksburg, Montgomery County.
BM: Bent Mountain, Roanoke County; part of the Floyd Plateau south of Roanoke. Numerous swampy areas. Altitude ca. 3,000 feet.
FL: Fort Lewis, 3 mi. W of Salem on Route 11. A marshy meadow.
FLM: Fort Lewis Mountain north of Salem and extending westward, referring to the southern slope near Salem. Oak-heath associations.
M: Montgomery County.
MC: Mason Creek, north of Hanging Rock, 2.6 mi. NNE of Salem P. O.
MF: Martin's Farm, a damp meadow 0.8 mi. N of Salem P. O.
KH: Katz Hill, a brushy hillside 0.9 mi. of N of Salem P. O. Dry scrub woods.
OF: Orphanage Falls, second growth woods with oak, pine, *Vaccinium,* 1.8 mi. NNW Salem P. O. at the foot of Fort Lewis Mountain. Clearings and trails numerous. Altitude ca. 1,500 feet.
PC: Poverty Creek, flowing eastward into Craig Creek which drains Poverty Hollow. Swampy areas.
PH: Poverty Hollow, an intermontane valley between Gap and Brush Mountains in Montgomery and Craig Counties, referring particularly to the Montgomery County end.
PM: Poor Mountain, SW of Salem, lying in both counties. Altitude 3,960 feet. Collections along fire roads.
R: Roanoke County.
RC: Roanoke College Campus, Salem.
RR: Roanoke River, south of Salem.
SC: Scout Cabin, Fort Lewis Mt., 3 mi. NW of Salem P. O. Cool, wooded ravine.
VPI: Virginia Polytechnic Institute, Blacksburg.
WM: Whitethorn Meadows, south of VPI campus.

List of Species.

There follows a list of the species and subspecies of butterflies known from Roanoke and Montgomery Counties. The earliest and latest dates of capture, as well as other dates where possible, of each species are noted, and although this may give a somewhat exaggerated idea of the period of flight of certain species, dates being in many instances from different years, a general idea of the time of flight in this part of Virginia is afforded. Localities are in most cases noted by the capital letters given above. All identifications have been kindly checked by Dr. A. H. Clark or Dr. E. A. Smyth, Jr., or by both.

Family Nymphalidae; Subfamily Satyrinae.

Megisto cymela (Cramer). FLM, vi 24, '38; vii 1, '37. KH, v 6-21, '38. M, v 25, vi 2, '99.

Satyrodes eurydice (Linné). M, viii 20, '98 (dark).

Minois pegala alope (Fabricius). FL, viii 20, '38. MF, viii 20, '37. M, no date.

M. pegala maritima (W. H. Edwards). FL, vi 24, '38; vii 21, '36; viii 14, '37. BM, viii 5, '38; viii 23, '40. SC, vi 24, '38. M, no date.

Subfamily Nymphalinae.

Polygonia interrogationis (Fabricius). S, viii 26, '37; ix 28, '39; ix 30, '38 (bred). MF, v 21, '38. FL, v 27, '38 (*umbrosa*); vii 31, '37 (*umbrosa*); viii 19, '38. M, iv 2, '99.

P. comma (Harris). S, x 3, 10, '38. FL, vii 31, '37. KH, iii 23, '39; iv 15, '38; iv 24, '39. M, no date.

P. progne (Cramer). B, vii '02 (from larvae on gooseberry).

P. faunus smythi A. H. Clark. B, vii 30, vi 30, '96 (from larvae on gooseberry).

Nymphalis antiopa creta (Verity). S, iii 21, '38; KH, iv 13, '38. B, many larvae on willows on V. P. I. campus.

Vanessa atalanta (Linné). S, viii 11, '37. KH, iii 30, '38; ix 18, '39. FL, viii 6, '35; ix 8, '38. M, no date.

V. virginiensis (Drury). S, iv 6, '38; ix 16, '39; ix 29, '37. KH, v 29, '38. FL, vii 25, '39; viii 31, '38. M, no date.

V. CARDUI (Linné). S, ix 17, '39. FL, viii 10, '38; viii 28, '35. M, no date.

PRECIS COENIA Hübner. S, vii 26, '38; ix 8, '37 (wet form); x 31, '37; xi '37 (wet form). KH, x 31, '37. M, no date.

ASTEROCAMPA CELTIS (Boisduval and LeConte). RC, viii 27, '40. RR, ix 10, '40. FL, vi 26, viii 27, '38; viii 20, '36.

A. CLYTON (Boisduval and LeConte). VPI, vi 15, 23, 28, 30, '00.

BASILARCHIA ARTHEMIS ASTYANAX (Fabricius). KH, v 6, 9, ix 11, '38; vi 6, '39. FL, viii 27, '37. FLM, vii 5, '37. M, no date.

B. ARCHIPPUS (Cramer). MF, v 21, '38; ix 11, '38. FL, vii 20, '36; vii 20, '36; viii 23, '39; viii 29, '38. M, no date.

EUPHYDRYAS PHAETON (Drury). S, vi '37. AB, vi 5, '38. MC, vi 16, '38. WM, vi 1, '14; vii 1, '99. Tinker Mt., Botetourt Co., vi 17, '31.

PHYCIODES NYCTEIS (Doubleday and Hewitson). FLM, vi 25, '37. MC, viii 7, '40. Near Singer, on the Roanoke River, v 19, '40. M, v 16, '00; viii 5, '99.

P. THAROS (Drury). S, iv 18, '39; viii 12, '38. KH, iii 28, '38; iv 29, v 7, 21, '38. FLM, v 31, vi 14, '38. FL, ix 4, '39. M, vii 25, '99.

ARGYNNIS BELLONA (Fabricius). BM, viii 23, '40 (common). WM, vii 25, '99; viii '95.

A. IDALIA (Drury). S, vii 10, '38. KH, vi 8, '38. FL, viii 19, '38. WM, viii 19, '26.

A. DIANA (Cramer). FLM, vi 25, '36; viii 11, '37; vi 22, viii 27, 29, '38. PM, viii 23, '40. PC, viii 16, '02. PH, vi 24, viii 29, '96.

A. CYBELE (Fabricius). S, v 29, '38. CH, vi 7, '39; vi 22, '38. FL, v 25, '36; ix 5, '38. AB, vi 13, '37. M, v '96; vi 12, '00; viii '95.

A. APHRODITE (Fabricius). KH, vi 15, '38. FL, viii 22, '39. FLM, vi 25, '36. AB, vi 5, '38. R, vi 14, '37. M, no date.

EUPTOIETA CLAUDIA (Cramer). S, vi 6, '38; vii 27, '31; ix 7, '39. AB, vi 5, '37.

Subfamily Danaiinae.

DANAUS PLEXIPPUS (Linné). S, vi 6, ix 27, '38; ix 26, x 3, '39. FL, viii 28, '35. M, viii '99.

Subfamily Libytheinae.

LIBYTHEA BACHMANII Kirtland. CH, iv 13, v 6, '38. M, no date. Mt. Lake, Giles Co., viii 8, '39.

Family RIODINIDAE.

NYMPHIDIA BOREALIS (Grote and Robinson). PH, vii. Palmer Hill, east of Blacksburg, vi 26, '39; vii 2, '00. Tinker Mt., Botetourt Co., vi 30, '40 (Van Gelder).

Family LYCAENIDAE; Subfamily Spalginae.

FENISECA TARQUINIUS (Fabricius). S, vi 13, '38; vii 2, '39. FLM, v 7, '38. M, iv 2, 4, 26, v 16, '00.

Subfamily Lycaeninae.

LYCAENA PHLAEAS HYPOPHLAEAS (Boisduval). S, iv 11, '38. KH, iv 9, 25, ix 23, '38. FL, vi 7, 12, viii 4, '38. M, v '95.

LYCAENOPSIS ARGIOLUS PSEUDARGIOLUS (Boisduval and LeConte). S, v 20 (*neglecta*), viii 6, '38. KH, iii 18, '38 (*violacea*); iii 23, '39. OF, iv 25, '40 (*neglecta*). FL, viii 27, '38. M, iv '96 (*neglecta*); viii '98.

GLAUCOPSYCHE LYGDAMUS (Doubleday). S, iv 24, 27, v 3, '31; v 19, '32. KH, v 17, '40. FLM, iv 5, '39. SC, iv 8, '39. MF, iv 13, '38. B, iv 10, 18, '03. VPI, v 2, '00. Near Palmer Hill, iv 18, '98. Near Christiansburg, v 10, '40. Camp Powhatan, Rockbridge Co., v 1, '38.

EVERES COMYNTAS (Godart). S, iv 12, v 12, '38. KH, iv 11, '39; iv 4, '40. FL, vi 18, viii 14, '38. FLM, v 9, '37. OF, iv 25, '40. M, iv 17, v 27, '98. Sunset Village, Montgomery Co., viii 17, '38.

Subfamily Theclinae.

ATLIDES HALESUS (Cramer). M, ix 10 (caught by a student, presumably near Blacksburg).

STRYMON TITUS MOPSUS (Hübner). East side of Roanoke River, near Blacksburg, vi 19, '99; vi 26, '00.

S. M-ALBUM (Boisduval and LeConte). S, ix 15, '37; ix 15, '38. North of Salem, ix 6, '39. B, ix 15, '22. Bent Mt., Floyd Co., vi 23, '38.

S. LIPAROPS (Boisduval and LeConte). FLM, vii 3, '37.

Palmer Hill, vi 15, '96. M, vi 24, '02.

S. FALACER (Godart). FLM, vi 17, '37; vi 22, '38. M, vi 13, '00; vii 2, '02; viii 1, '99.

S. CECROPS (Fabricius). KH, iv 23, 25, 26, 28, v 7, '38. FL, vii 23, '36; ix 2, '38. FLM, v 7, '38; viii 16, '38. SC, viii 11, '37 (type, ab. *gottschalki* A. H. Clark)[4]. M, vii 21, '02; viii 7.

S. MELINUS Hübner. KH, iii 31, '39; viii 26, '37. FL, viii 5, '37; viii 15, '36. M, viii 28, '00.

MITOURA GRYNEUS (Hübner). KH, iv 16, '38. FL, vi 28, '38. M, iv 5, '02; iv 23, '95; '99.

INCISALIA AUGUSTINUS (Westwood). KH, iii 26, iv 13, 24, '38. FLM, v 2, '37. SC, iii 19, 20, iv 15, '38. OF, iv 9, '38 (common).

I. IRUS (Godart). KH, iii 31, iv 13, 16, 28, v 7, '38. OF, iv 15, '38.

I. HENRICI (Grote and Robinson). KH, iii 25, iv 15, 19, 25, '38. Palmer Hill, Montgomery Co., v 9, '98.

I. POLIOS Cook and Watson. OF, iv 5, '38 (specimen in U. S. National Museum).

I. NIPHON (Hübner). KH, iv 14, '38. FLM, iv 8, '39; v 2, '37. AB, iv 23, '38. Foot of 12 o'Clock Knob, v 9, '37.

Family PAPILIONIDAE; Subfamily Pierinae.

PIERIS RAPAE (Linné). S, iii 30, '38; iv 1, x 16, '40.

P. PROTODICE Boisduval and LeConte. S, iv 6, '40 (*vernalis*). FL, vi 17, '37; vii 9, '36; vii 12, '35; vii 24, '38; viii 22, '38; ix 1, '39. M, iii 26, '98; x 19, '02.

ANTHOCHARIS GENUTIA (Fabricius). S, iv 10, '39; v 19, '40. KH, iv 14, 28, v 6, '38. AB, iv 12, '39; iv 23, '38 (large). Dixie Caverns, Roanoke Co., v 5, '40. M, iv 17, v 1, '98. Mill Creek, Montgomery Co., vi 1, '98.

PHOEBIS PHILEA (Linné). 12 o'Clock Knob, Salem, x 15, '28.

P. EUBULE (Linné). S, viii 6, '29; iv 12, '38. B, v 10, '21; x 6, '98; x 23, '31.

(To be continued.)

[4] Clark, Proc. Biol. Soc. Wash., 51: 1-6

Six New Diplopods of the Family Xystodesmidae.*

By Nell Bevel Causey, Department of Zoology,
University of Arkansas.

The purpose of this paper is to describe new species of diplopods of the Family Xystodesmidae Cook 1904 occurring in North Carolina, Kentucky, and Tennessee. The holotypes are in the collection of the Academy of Natural Sciences of Philadelphia, and allotypes and paratypes are in the author's personal collection.

DELTOTARIA new genus.

Genotype: *D. brimleii* new species.

This genus resembles *Apheloria* in the curvature and the length of the principal blade of the telopodite of the male gonopods, but differs in having a thin subterminal process on the blade. It differs from other genera of this family in that the gonopods bear a large medial pointed coxal peg in addition to the characteristic sickle-like coxal spine.

Deltotaria brimleii new species (Figs. 1, 2).

Color in life unknown; dorsum, head, and antennae of dried specimens brown; keels, posterior margins of tergites, and margins of collum faded red-orange; legs and under parts pale yellow.

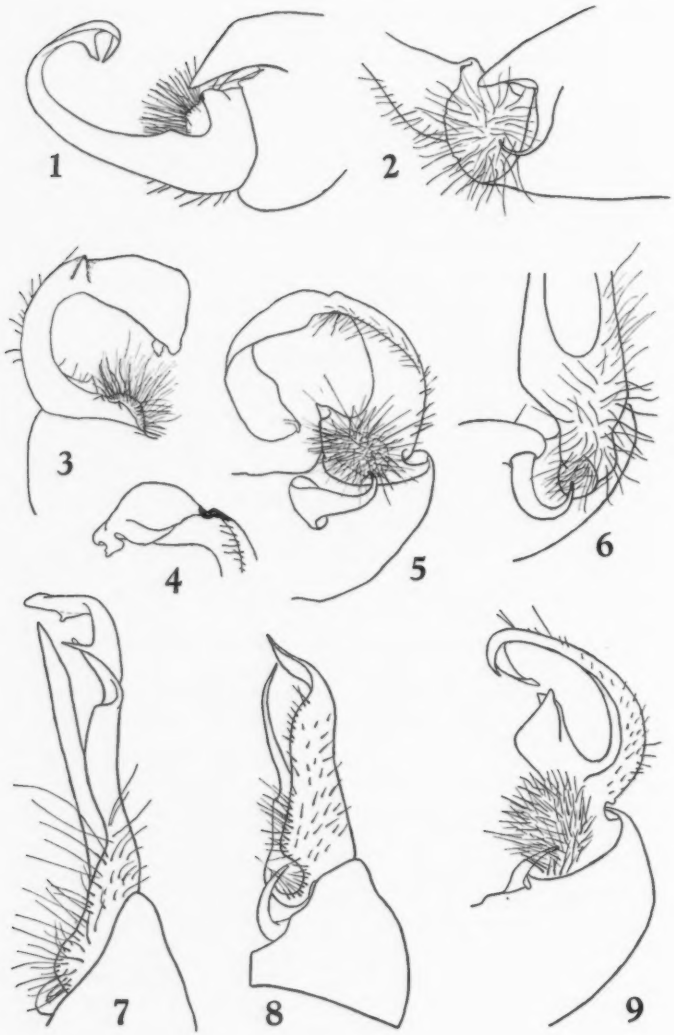
Repugnatorial pores on upper margin of posterior third of keels. Dorsum more arched than is usual in this family. Coxae posterior to gonopods spined. Sternites unarmed. Body parallel-sided over middle portion, gradually narrowed anteriorly, abruptly narrowed posteriorly.

In situ main blades of gonopods subparallel and perpendicular to longitudinal axis of body. Flattened apical third of main blade bent cephalad, ending in a thin subapical process and an attenuated apical hook (Fig. 1). Basal medial portion of blade thickly setose and proximal third sparsely setose. A large pointed peg on medial side of coxa and adjacent to the curved coxal spine of the gonopod (Fig. 2).

Length of male holotype, 31 mm.; width, 8.2 mm. Length of female allotype, 32 mm.; width, 29.3 mm.

Type.— ♂ Swannanoa, North Carolina; May 26, 1923 (Dr. C. S. Brimley). *Allotype.*—1 ♀ ; same data.

* Research Paper No. 735, Journal Series, University of Arkansas.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Fontaria kentuckiana new species (Figs. 3, 4).

The general appearance of the gonopods *in situ* is similar to that shown by Gray for *virginiensis*, the type species of this genus; but in detail the gonopods are quite unlike the figure given by Williams and Hefner (1928) for *virginiensis*. The color of *virginiensis* was given by Gray as pale yellow; in *kentuckiana* the dorsum is shining dark brown; head and antennae brown; ends of collum, posterior angles of keels, roughly triangular areas on tergites or borders of tergites and collum red-orange; distal half of legs red-orange; under parts and proximal half of legs pale yellow. In alcohol dorsum fades to brown and keels and legs to yellow.

Repugnatorial pores on upper margin of posterior half of keels. Dorsum moderately arched. Body parallel-sided, gradually narrowed anteriorly, abruptly narrowed posteriorly. Anterior of female narrower than that of male. Coxae posterior to gonopods spined. Sternites unarmed. Six anterior pairs of legs of male shorter, thicker, and more setose than those of female.

Main blade of gonopod curves anterio-medially, crosses that of other gonopod, and ends in a large clavate structure that bears an inconspicuous curved apical process (Figs. 3, 4); proximal to clavate structure is a transverse ridge of chitin; telopodite densely setose at base and sparsely setose on caudal margin of blade from base to chitinous ridge; three small dentate processes on base of telopodite.

Length of male holotype, 47.5 mm.; width, 11.7 mm. Length of female allotype, 52 mm.; width, 12.4 mm.

Type.— ♂ ; Cumberland Falls State Park, KENTUCKY; June 16, 1940. *Allotype.*— ♀ ; same data. *Paratypes.*—1 ♂ , 6 ♀ , and several larvae of sixth and seventh stadia; same data.

Cleptoria splendida new species (Fig. 5).

Distinguishable from *macra* in having a medial row of bright yellow spots on the tergites. The main blade of the male gonopod is more regularly curved than in *macra* and the ter-

Explanation of Figures

Fig. 1. *Deltotaria brimleii*, right gonopod, subcephalad view (x 30).
Fig. 2. *Deltotaria brimleii*, right gonopod, caudo-medial view (x 30).
Fig. 3. *Fontaria kentuckiana*, right gonopod, subcephalad view (x 15).
Fig. 4. *Fontaria kentuckiana*, right gonopod, subcaudal view (x 15).
Fig. 5. *Cleptoria splendida*, left gonopod, medial view (x 15).
Fig. 6. *Nannaria scutellaria*, left gonopod, ventral view (x 30).
Fig. 7. *Nannaria scutellaria*, left gonopod, submedial view (x 30).
Fig. 8. *Aporiaria deturkiana*, left gonopod, subventral view (x 30).
Fig. 9. *Apheloria bidens*, left gonopod, submedial view (x 15).

minal part is less beak-like.

Dorsum, head, and antennae black; tergites trimaculate, all spots bright yellow; spots on latero-posterior corners of keels and ends of collum triangular; medial spots on tergites triangular to trapezoidal; medial spots on collum hourglass-shaped; legs yellow; underparts pale yellow.

Repugnatorial pores on posterior third of upper surface of margin of keels. Dorsum moderately arched. Coxae posterior to gonopods spined. Sternites of seventh to seventeenth segments bluntly spined. Body parallel-sided over middle portion, abruptly narrowed anteriorly, and gradually narrowed posteriorly. Six anterior pairs of legs shorter and thicker than any others.

Main blade of gonopod curves meso-cephalad, crosses blade of opposite gonopod, curves dorsad, and then caudad, almost forming a complete ellipse. About midway of the wide flattened blade there is a transverse furrow beyond which the blade is wider. A sharp peg arises from the large base on the cephalad surface of the telopodite (Fig. 5).

Length of male holotype, 49 mm.; width, 11 mm.

Type.— ♂ ; Pine Mountain State Park, KENTUCKY; June 16, 1940.

Nannaria scutellaria new species (Figs. 6, 7).

Similar in size and coloring to *tennesseensis*. In *scutellaria* there is a definite terminal geniculation in the principal blade of the gonopod, while in *tennesseensis* this blade is "somewhat flattened and wavy, end slightly expanded." The shorter branch of the telopodite in both species is twisted near the base.

Dorsum dark brown; head and antennae light brown; keels red; legs and underparts pale yellow.

Repugnatorial pores on posterior third of margin of keels. Dorsum moderately arched. Sternite of fifth body segment of male bears a pair of conical processes between bases of fourth pair of walking legs. Sternites posterior to gonopods spined. Coxae unarmed. Shield-like sternite of third body somite of female compressed subvertically. Small nipple-like area near each gonopod of female. Setae on three proximal joints of legs continued across sternites in male but not in female. Body parallel-sided over middle portion, gradually narrowed anteriorly and posteriorly; anterior of female narrower than that of male.

Blades and processes of telopodites of gonopods subparallel with main axis of body. Main blade sharply bent so that its apex is but slightly anterior to apex of straight process (Fig. 7); proximal to the bend there is a constriction and a deflection

of part of blade as two minute appressed spines directed medially; small tooth proximal to truncated apex.

Length of male holotype, 24 mm.; width, 4.2 mm. Length of female allotype, 26.4 mm.; width, 5 mm.

Type.—♂; Great Smoky Mountains National Park, near Chimneys, TENNESSEE; June 21, 1940. *Allotype.*—♀; same data.

Aporiaria deturkiana new species (Fig. 8).

Similar to *geniculata* in coloring. Gonopods similar to those of *carolina*. Can be distinguished from both *geniculata* and *carolina* by presence of spines on coxae posterior to gonopods.

Dorsum shining black with a green tinge; orange triangle on posterior corners of keels and ends of collum; thin orange line around collum and on posterior margins of most tergites; legs, underparts, and antennae pale yellow. In alcohol dorsum fades to brown and keels to pale yellow.

Repugnatorial pores on posterior third of upper margin of keels. Keels inconspicuous. Body parallel-sided over middle portion, gradually narrowed anteriorly, abruptly narrowed posteriorly. Dorsum more arched than is usual in this family. Coxae posterior to gonopods spined. Sternites unarmed.

Blades and processes of telopodites of gonopods subparallel with main axis of body. Thin apical portion of main blade curves mesad and ends in an acute point (Fig. 8). Apex of coxal spine lies in a cup-like pit on mesal surface of main blade. Coxae of gonopods closely appressed medially.

Length of male holotype, 32.5 mm.; width, 6.3 mm. Length of female allotype, 36.3 mm.; width, 7.8 mm.

Type.—♂; Highlands, NORTH CAROLINA; June 14, 1940 (Dr. William DeTurk). *Allotype.*—♀; same data. *Paratype.*—1 ♂; same data. *Other localities.*—Several males and gravid females, Great Smoky Mountains National Park, near Clingman's Dome, TENNESSEE; June 23, 1940; the length of the males was about 25 mm., and the gravid females were as long as 40 mm. Several larval and adult females; same data, but near Alum Cave.

Apheloria bidens new species (Fig. 9).

General appearance of male gonopods resembles *aspila*, but *bidens* can be distinguished by the larger basal process and the small subapical process of the main blade of the telopodite.

Dorsum dark brown; head and antennae lighter brown; lateral portions of keels and ends of collum bright red; distal

half of legs red; under parts and proximal half of legs pale yellow.

Repugnatorial pores on posterior third of upper edge of keels. Dorsum more arched than usual in this family. Sternites unarmed. Coxae posterior to gonopods spined. Body parallel-sided over middle portion, abruptly narrowed anteriorly, gradually narrowed posteriorly.

Gonopods especially distinct in the large bluntly furcate basal process and the small lateral subapical process of the main blade of the telopodite (Fig. 9).

Length of male holotype, 43 mm.; width, 9.1 mm. Length of female allotype, 44.6 mm.; width, 10.7 mm.

Type.—♂; Great Smoky Mountains National Park, near Chimneys, TENNESSEE; June 21, 1940. *Allotype.*—♀; same data. *Paratypes.*—3♀; same data.

Again: Why does Gyrinus Circle? (Coleoptera; Gyrinidae).

Abbott's stimulating paper, "Why Does Gyrinus Circle?" in *Entomological News*, Vol. LII, No. 10, December, 1941, pp. 287-290, describes how Gyrinidae perceive minute vibrations at the water's surface and are thereby led to the discovery of wounded prey. The vibration-perceptors are located in the antennae and are sensitive to vibrations within a radius of three or four centimeters.

No criticism of a minor point in Abbott's paper should be allowed to draw credit from the ingenious experiments by which the above physiological facts were discovered. It may be pointed out however, that the demonstration of vibration-perceptors in the antennae still fails to explain why *Gyrinus* circles. At the close of his paper Abbott states:

"By *circling*, *Gyrinus* greatly increases the area of surface which it covers in a given time, and hence, naturally increases its *chances* of encountering vibrations set up on the surface of the water."

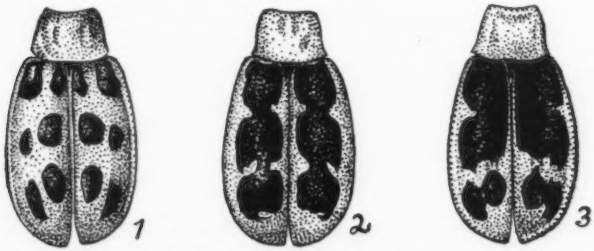
Not only is such a conclusion unrelated to the experimental evidence presented by Abbott, but it is also mathematically untrue. If the insect moved forward in a straight line, it would cover a greater surface in a given time than it would by circling, for each time it crossed a point where it had already been, it would cover a portion of territory already found sterile. Thus its intersections of an old track would *reduce* the "chances of encountering vibrations set up on the surface of the water."

I return the question to further consideration by scientists.—C. BROOKE WORTH, Edward Martin Biological Laboratory, Swarthmore College, Swarthmore, Pennsylvania.

Color Aberrance in Diabrotica 12-punctata Fab. (Col.: Chrysomelidae).

By W. V. Balduf.*

The purpose of this note is to describe two adult individuals of the above species of beetle that display a marked departure from the normal pattern of colors. One of these (fig. 2) was taken in a light trap at Urbana, Illinois, on August 24, 1938, by Garland T. Riegel, entomological assistant of the Illinois Natural History Survey, who generously consented to my present use of the specimen. The other (fig. 3) I obtained by sweeping vegetation along a railroad bank near Tolono, Illinois, on October 18, 1941. To facilitate appreciation of the nature and extent of the aberration, the normal color plan of this common species is pictured (fig. 1).



Close comparison of the abnormal specimens with the usual normal color type reveals that they are aberrant only in the design of the elytra. As all entomologists know, the species normally bears 12 black spots on a background of green or yellow, all the spots being limited to the elytra. Each elytrum possesses three pairs situated at about equal and distinct intervals of space.

In the abnormal individuals concerned here, not only are the spots of the anterior and middle pairs so greatly enlarged that they are confluent, but these pairs are themselves largely joined. However, the posterior pair of each wing remains wholly separate from the median pair in one specimen (fig. 3) and is only partly connected with it in the other (fig. 2). While the

* Contribution No. 225 from the Entomological Laboratories of the University of Illinois.

abnormality is therefore similar in general in the two individuals it is decidedly not identical; reference to the figures will show that several minor differences exist. Superficially, these beetles seem to have produced an extraordinary amount of black pigment, which consequently overflowed into adjacent areas beyond the normal limits and forms of the 12 spots.

This species is available in greater or lesser numbers here every year, and the beetle is large enough to permit notice readily of any unusual departures in dorsal color pattern. In my collecting experience, aberrations of this kind have not been noticed heretofore.

The environmental causes, if any, and the internal mechanics and chemistry of unusual insect color phenomena seem to require much more careful research before full understanding is reached. Basic investigations in this field obviously demand skill in microtechniques, a mastery of biological chemistry and inquiry into the minutiae of insect structure. Recent summaries of the subject matter on insect colors are available in Imms, A. D., *Recent Advances in Entomology*, 1931, and Folsom, J. W. and Wardle, R. A., *Entomology*, 1934.

The Malaria-carrying Anopheles gambiae (Diptera: Culicidae).

The NEWS for May, 1941, page 125, quoted the Rockefeller Foundation Review for 1940 that "No evidence of gambiae in Brazil was found during the last 47 days of 1940." The same Review for 1941, referring to this statement says (p. 17): "It will be remembered that this was the mosquito which, imported from Africa by airplanes or fast navy destroyers, had been responsible for a widespread and devastating malaria epidemic. As a malaria vector this mosquito was more efficient than any anopheline indigenous to America, and its further spread was greatly feared . . . It is a satisfaction to report tha no infested areas were discovered during the entire year 1941. Commercial planes are now carefully fumigated, both after they leave Africa and again before their passengers are discharged in Brazil. A dead female gambiae was discovered after fumigation in a plane arriving in Brazil in October, 1941, and two more in January, 1942."

List of Titles of Publications Referred to by Numbers in Entomological Literature in Entomological News.

1. Transactions of The American Entomological Society. Philadelphia.
2. Entomologische Blätter, red. v. H. Eckstein etc. Berlin.
3. Annales Sci. Naturelles, Zoologie, Paris.
4. Canadian Entomologist. London, Canada.
5. Psyche, A Journal of Entomology. Boston, Mass.
6. Journal of the New York Entomological Society. New York.
7. Annals of the Entomological Society of America. Columbus, Ohio.
8. Entomologists' Monthly Magazine. London.
9. The Entomologist. London.
10. Proceedings of the Ent. Soc. of Washington. Washington, D. C.
11. Deutsche entomologische Zeitschrift. Berlin.
12. Journal of Economic Entomology, Geneva, N. Y.
13. Journal of Entomology and Zoology. Claremont, Cal.
14. Archivos do Instituto Biologico, Sao Paulo.
15. Annales Academia Brasileira de Sciencias. Rio de Janeiro.
17. Entomologische Rundschau. Stuttgart, Germany.
18. Entomologische Zeitschrift. Frankfurt-M.
19. Bulletin of the Brooklyn Entomological Society. Brooklyn, N. Y.
21. The Entomologists' Record and Journal of Variation. London.
22. Bulletin of Entomological Research. London.
23. Bolletino del Lab. di Zool. gen. e agraria della Portici. Italy.
24. Annales de la société entomologique de France. Paris.
25. Bulletin de la société entomologique de France. Paris.
27. Bolletino della Societa Entomologica Italiana. Genova.
28. Ent. Tidskrift utgifen af Ent. Föreningen i Stockholm. Sweden.
29. Annual Report of the Ent. Society of Ontario. Toronto, Canada.
30. Archivos do Instituto de Biologia Vegetal, R. d. Janeiro.
31. Nature. London.
32. Boletim do Museu Nacional do Rio de Janiero. Brazil.
33. Bull. et Annales de la Société entomologique de Belgique. Bruxelles.
34. Zoologischer Anzeiger, hrsg. v. E. Korschelt. Leipzig.
36. Trans. Royal Entomological Society, London. England.
37. Proceedings of the Hawaiian Entomological Society. Honolulu.
38. Bull. of the Southern California Academy of Sciences. Los Angeles.
39. The Florida Entomologist. Gainesville, Fla.
40. American Museum Novitates. New York.
41. Mitteilungen der schweiz. ent. Gesellschaft. Schaffhausen, Switzerland.
42. The Journal of Experimental Zoology. Philadelphia.
43. Ohio Journal of Sciences. Columbus, Ohio.
44. Revista chileña de historia natural. Valparaiso, Chile.
46. Zeitschrift für Morphologie und Ökologie der Tiere. Berlin.
47. Journal of Agricultural Research. Washington. D. C.
50. Proceedings of the U. S. National Museum. Washington, D. C.
51. Notulae entomologicae, ed. Soc. ent. Helsingfors. Helsingfors, Finland.
52. Archiv für Naturgeschichte, hrsg. v. E. Strand. Berlin.
53. Quarterly Journal of Microscopical Science. London.
55. Pan-Pacific Entomologist. San Francisco, Cal.
57. La Feuille des Naturalistes. Paris.
58. Entomologische Berichten. Nederlandsche ent. Ver. Amsterdam.
59. Encyclopédie entomologique, ed. P. Lechevalier. Paris.
60. Stettiner entomologische Zeitung. Stettin, Germany.

61. Proceedings of the California Academy of Sciences. San Francisco.
62. Bulletin of the American Museum of Natural History. New York.
64. Zeitschrift des österr. entomologen-Vereines. Wien.
65. Zeitschrift für angewandte Entomologie, hrsg. K. Escherich. Berlin.
67. University of California Publications, Entomology. Berkeley, Cal.
68. Science. New York.
69. Physis. Revista Soc. Argentina Cien. Nat. Buenos Aires.
70. Entomologica Americana, Brooklyn Entomological Society. Brooklyn.
71. Novitates Zoologicae. Tring, England.
72. Revue russe d'Entomologie. Leningrad, USSR.
73. Mem. Instituto Butantan. Sao Paulo, Brazil.
75. Annals and Magazine of Natural History. London.
77. Comptes rendus heb. des séances et mémo. de la soc. de biologie. Paris.
78. Bulletin Biologique de la France et de la Belgique. Paris.
79. Koleopterologische Rundschau. Wien.
82. Bulletin, Division of the Natural History Survey. Urbana, Illinois.
83. Arkiv för zoologie, K. Svenska Vetenskapsakademien i. Stockholm.
84. Ecology. Brooklyn.
87. Archiv für Entwicklungsmechanik der Organ., hrsg. v. Roux. Leipzig.
88. Die Naturwissenschaften, hrsg. A. Berliner. Berlin.
89. Zoologische Jahrbücher, hrsg. v. Spengel. Jena, Germany.
90. The American Naturalist. Garrison-on-Hudson, New York.
91. Journal of the Washington Academy of Sciences. Washington, D. C.
92. Biological Bulletin. Wood's Hole, Massachusetts.
93. Proceedings of the Zoological Society of London. England.
94. Zeitschrift für wissenschaftliche Zoologie. Leipzig.
95. Proceedings of the Biological Soc. of Washington, Washington, D. C.
97. Biologisches Zentralblatt. Leipzig.
98. Le Naturaliste Canadien. Cap Rouge, Chicoutimi, Quebec.
101. Tijdschrift voor entomologie. Nederland. Ent. Ver., Amsterdam.
102. Entomologiske Meddelelser, Entomologisk Forening, Copenhagen.
103. Journal of the Kansas Entomological Society, Lawrence, Kansas.
104. Revista de la Sociedad entomologica Argentina, Buenos Aires.
105. Revista de Entomologia, Rio de Janeiro, Brazil.
106. Anales Sociedad Cientifica Argentina, Buenos Aires.
107. Proc., Royal Entomological Society, London.
108. Revista, Col. Nac. Vicente Rocafuerte, Guayaquil.
109. Arbeiten uber morpholog. und taxonom. ent. aus Berlin-Dahlem.
110. Arbeiten ueber physiolog. u. angewandte ent. aus Berlin-Dahlem.
111. Memorias do Instituto Oswaldo Cruz. Rio de Janeiro.
112. Anales del Instituto de Biologia Mexico.
114. Occasional Papers of the Museum of Zoology, University of Michigan.
115. Memorias de la Soc. Cubana de Hist. Nat. Havana, Cuba.
116. Parasitology. Ed. Keilin and Hindle. London.
117. Microentomology, Stanford University.
118. Ward's Ent. & Nat. Sci. Bull., Rochester, N. Y.
119. American Midland Naturalist, Notre Dame, Ind.
120. The Great Basin Naturalist, Provo, Utah.
121. Ciencia, Mexico City.
122. Revista Museo de la Plata, Buenos Aires.
123. Indian Journal of Entomology, New Delhi.

Current Entomological Literature

COMPILED BY THE EDITORIAL STAFF.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

This list gives references of the current or preceding year unless otherwise noted. All continued papers, with few exceptions, are recorded only at their first installment.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

Note. References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

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factor inducing the hibernation of Polistes annularis. [7] 35: 94-96.

SPECIAL NOTICES—Systema Aphididae.—A guide to the phylogeny of the aphids or plant lice. Part 1. The Lachnea. By O. W. Oestlund. Minnesota. 1942. 78pp.

COLLEGE ENTOMOLOGY. By E. O. ESSIG, Professor of Entomology, Entomologist in the Agricultural Experiment Station, University of California. New York. The Macmillan Company. 1942. Pp. vii, 900. 308 figs. $5.00—Of recent text books of entomology, in English, this one devotes a proportionally larger share of its pages to taxonomy, as may be seen from the following comparative figures. The first numerals show the number of pages on each topic, those in parenthesis give the percentage value thereof. The sequence of subjects is that of the present volume.

ESSIG, 1942: Metamorphosis of insects 12 (1.33), Anatomy 40 (4.44), Classification of insects 6 (.67), Thirty-three orders 770 (85.55), General references 3 (.33), Index of authors 5+63 of subjects=68 (7.55), Total pages 907, Number of figures 308, Lines of larger type per page 45, of smaller type 49.

METCALF and FLINT, Fundamentals of Insect Life, 1932: Development and metamorphosis 24 (4.05), Anatomy and physiology 61 (10.3), Twenty-three orders 182 (30.74), Other topics (place of insects, control, ecology, behavior) 254 (42.91), General references 5 (.84), Index 55 (9.29), Total pages 592, Number of figures 315, Lines of larger type per page 42, of smaller type 52.

IMMS, General Textbook of Entomology, 3rd edition, 1934: Development and metamorphosis 42 (5.68), Anatomy and physiology 169 (22.87), Classification 4 (.54), Twenty-three orders 479 (64.82), References at the ends of the various sections. Index of authors 8+25 of subjects=33 (4.46), Total pages 739, Number of figures 624, Lines of larger type per page 53, of smaller type 65.

COMSTOCK, Introduction to Entomology, Ninth edition, 1940: Metamorphosis 40 (3.70), Anatomy 139 (12.84), Classification 11 (1.02), Twenty-six orders 791 (73.10), General references 20 (1.85), Index 36 (3.33), Total pages 1082, Number of figures 1228, Lines of larger type per page 41, of smaller type 61.

The greater share given to taxonomy in Prof. Essig's book directs attention to this topic. The thirty-three orders here

recognized are essentially those of Handlirsch (in Schröder's Handlirsch, 1913-1925) and of Brues and Melander (Classification of Insects, 1932), except that the names employed are not always the same. The chief taxonomic difference between the three works is that Essig, reverting to "a continued acceptance of Latreille's views" (p. 263), considers the Homoptera and Heteroptera together as one order, Hemiptera. In his preface our author states that "he has considered with great care every change involving the name of an order, family or genus, and the whole is the product of much research, discussion and progressive thinking." As a consequence the name of each order, suborder and family in chapters IV-XXXVI is followed by that of its author and date. Historical evidence for the conclusions reached is often given in footnotes. Quoting again from the preface: "In assigning authors and dates to the names of orders and families considerable difficulty has been experienced in determining priority, and there are no doubt errors in these debatable matters. Suggestions and corrections will be most welcome." We foresee a lively and prolonged discussion of Prof. Essig's results. The accents and derivation of these group names are usually given. The species which are included in this book "have been selected for one of three reasons: (1) long associations with the human race; (2) some peculiarity in form, size, color, habits; or (3) interesting and typical examples of the family." The author "has treated the subject from a world viewpoint rather than from a continental one." Thus, in the family Saturniidae, the giant silkworms, nine North American species and thirteen from other continents are mentioned or described; corresponding figures from Imms are one and ten, from Comstock twelve and one. Keys to the orders, superfamilies and families are supplied. Following the treatment of each order is a list of selected references which extend, in various sections, from 1783 to 1940. Many of the references credited to C. Schröder are really due to Handlirsch and other authors who contributed to the *Handbuch der Entomologie* edited by Schröder. At the beginning of each chapter dealing with a larger order is usually a tabular statement of the anatomical characters, external and internal of the imagos and frequently also of the larvae. Many of the figures are new, some have been taken from the author's *Insects of Western North America* (1926) and *A History of Entomology* (1931); the remainder are from other writers, including Moufet (1634) and Swammerdam (1738). On the inside of the front and rear covers and the fly-leaves facing them is a map of the world in colors showing the usual five zoogeographical regions. We

have not sought for errors in the text, but the dates given (p. 2) for Aristotle "(257-185 B. C.)" are not those (384-322 B. C.) to be found in most works on the Greek philisopher. Prof. Essig's new book is well done and a noteworthy addition to entomology. P. P. CALVERT.

FERNALD CLUB YEARBOOK. The Fernald Club, 1941, Massachusetts State College, Amherst, Mass. Number 11. January 1942. Dedicated to Harold Locke Frost. 36 mimeographed pages.—The "aims and guiding purpose of this yearbook are the same as they were eleven years ago—to assemble an account of the activities and achievements of the students, the department and its graduates; to foster a close relationship between students and faculty at the college and graduates working in the field, and to preserve for present and future entomologists information of historical interest which might otherwise be lost." Vincent A. Lafleur, of the Class of 1942, is editor. The staff of the department of entomology and zoology in 1941 comprised one emeritus professor (Henry T. Fernald), five professors, three assistant professors, two instructors, four assistants, two teaching fellows and one clerk. Additions of 6500 specimens during 1941 bring the totals in the insect collection to 9850 species and 75,933 named specimens. Varied activities, including publications, of the staff and students are listed. The work in economic entomology of an earlier student, Charles Pugsley Lounsbury, as Government Entomologist of the Colony of the Cape of Good Hope, 1895-1927, is summarized on pages 21-24 by Prof. C. P. Alexander. Obituaries of recently deceased students who published or did other active work in entomology include Harold Locke Frost, 1875-1940; Frederick Andrew Johnston, 1887-1941; Thomas Henry Jones, 1885-1941; and Dr. John Nicholas Summers, 1884-1941. A reproduction of a group photograph of the departmental personnel appears on the first page of the cover. P. P. CALVERT.

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This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow: the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

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Wanted—To buy, specimens of bees of the genus **Nomada**, any quantity, especially North American. Quote price, locality. Hugo G. Rodeck, University of Colorado Museum, Boulder Colorado.

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